REMARKS

Claims 1, 3-13, 15-20, 44, 55, 57-65, and 67-74 are all the claims pending in the application. Claims 2, 56, and 66 are cancelled, above. Claims 11-13, 15-20, 44, and 56-64 are allowed. Claims 5-6 and 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Therefore, claims 5, 6, 9, and 10 have been rewritten in independent form. Claims 1, 3-13, 15-20, 55, 57-65, and 67-74 stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1, 4, 7, 8, 55 stand rejected under 35 U.S.C. §102(b) as being anticipated by Goto (JP 05226655). Claims 65, 68, 71 and 72 stand rejected under 35 U.S.C. §102(b) as being anticipated by Taur et al. hereinafter "Taur" (U.S. Patent No. 5,646,058). Claim 3 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Goto. Claim 67 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Taur. Claim 69 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Uesugi et al. (hereinafter "Uesugi"). Claim 70 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Pfiester (U.S. Patent No. 5,166,084). Claims 73 and 74 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Taur in view of Yamanaka (U.S. Patent No. 5,834,797). Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejections Based on Goto

Goto does not teach or suggest many features defined by independent claims 1 and 55 including that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate." Because the invention forms the first gate and the

second gate in separate processing steps, the invention can form a structure that utilizes the same material for the different gates (e.g., polysilicon), yet dopes the first and second gates with different concentrations of impurity to adjust the work function of the device properly.

Goto does not disclose such a feature. Instead, Goto explains that the upper and lower gate electrodes are formed of the same material 19, 29 in a single process (see the English language abstract). This is also shown in Figures 1(e) and 4(c) of Goto where the same material 19, 29 is used as the upper and lower gate conductors. There is no mention in the English language abstract in Goto of doping and the material for the gate conductors differently. Indeed, since Goto forms the upper and lower gate conductors in a single processing step, Applicants submit that it would be impossible to provide different impurity concentrations in the upper and lower gates in the structure and methodology provided by the disclosure of Goto.

While the Office Action argues that it would have been obvious to adjust the concentration of impurities in the gate electrode to adjust the voltage threshold of the transistor, the processing disclosed in Goto prevents the impurity concentration within the electrodes from being different. More specifically, Goto requires that the upper and lower gate be formed at the same time using a single material formation/deposition process. This teaching makes it impossible to provide a different level of impurity between the different gates. Therefore, since the processing described in Goto prevents the upper and lower gate from having different impurity concentrations it is improper to conclude that such a structure having different impurity concentrations would have been obvious from the teachings of Goto.

Thus, it is Applicants position that Goto does not teach or suggest that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate" as defined by independent claims 1 and 55. Thus, Applicants respectfully submit that independent claims 1 and 55 are patentable over the prior art of record. Further, dependent claims 3, 4, 7, and 8 are similarly patentable because of their dependency from patentable independent claim 1 as well as because of the additional features of the invention they define. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the anticipation that and obviousness rejections that are based upon Goto.

B. The Rejections Based on Taur

Taur does not teach or suggest many features defined by independent claim 65 including that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate." Because the invention forms the first gate and the second gate in separate processing steps, the invention can form a structure that utilizes the same material for the different gates (e.g., polysilicon), yet dopes the first and second gates with different concentrations of impurity to adjust the work function of the device properly.

Taur does not disclose such a feature. Instead, Taur explains that the upper and lower gate electrodes are formed of the same material 30, 34 in a single process. More specifically, in column 3, lines 50-59, Taur explains that, referring to FIG. 2, gate material (e.g., polysilicon) is deposited and patterned as shown to form top gate 30 and bottom gate 34. A highly conformal CVD deposition is required here to refill the tunnel space (32 in FIG. 1(d)) left by the sacrificial films, and form the bottom gate electrode 34 self-aligned to the channel and the top gate. If necessary, Taur explains, alternate CVD and RIE steps can be employed to avoid sealing of the tunnel openings before the tunnel is filled by the gate material. There is no mention in Taur of doping and the material for the gate conductors differently. Indeed, since Taur forms the upper and lower gate conductors in a single processing step, Applicants submit that it would be impossible to provide different impurity concentrations in the upper and lower gates in the structure and methodology provided by the disclosure of Taur.

While the Examiner argues that it would have been obvious to adjust the concentration of impurities in the gate electrode to adjust the voltage threshold of the transistor, the processing disclosed in Taur prevents the impurity concentration within the electrodes from being different. More specifically, Taur requires that the upper and lower gate be formed at the same time using a single material formation/deposition process. This teaching makes it impossible to provide a different level of impurity between the different gates. Therefore, since the processing described

in Taur prevents the upper and lower gate from having different impurity concentrations it is improper to conclude that such a structure having different impurity concentrations would have been obvious from the teachings of Taur.

Thus, it is Applicants position that Taur does not teach or suggest that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate" as defined by independent claim 65. Thus, Applicants respectfully submit that independent claim 65 is patentable over the prior art of record. Further, dependent claims 67, 68, 71, and 72 are similarly patentable because of their dependency from patentable independent claim 65 as well as because of the additional features of the invention they define. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the anticipation and obviousness rejections based on Taur.

C. The Rejection Based on Taur in view of Uesugi

As shown above, Taur does not teach or suggest the invention defined by independent claim 65. As shown below, Uesugi similarly does not teach or suggest the invention defined by independent claim 65. Therefore, it is Applicants position that the proposed combination of references does not teach or suggest the invention defined by independent claims 65. Therefore, independent claim 65 (and dependent claim 69) are both patentable over prior art of record.

More specifically, the foregoing arguments regarding the Taur patent are hereby incorporated by reference. With respect to Uesugi, this reference also does not teach or suggest many features defined by independent claim 65 including that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate." Because the invention forms the first gate and the second gate in separate processing steps, the invention can form a structure that utilizes the same material for the different gates (e.g., polysilicon), yet dopes the first and second gates with different concentrations of impurity to adjust the work function of the device properly.

Uesugi does not disclose such a feature. Instead, Uesugi explains that the upper and lower gate electrodes are formed of the same material 30, 60. More specifically, in column 5, lines 31-37, Uesugi explains that, the second gate 30 is formed of polysilicon and that the first gate 60 is also formed of polysilicon. Uesugi also explains that the first and second gates are driven in a link manner, that is synchronously (column 5, lines 47-51), which indicates that the gates would be doped in a similar manner and not would be doped differently as in the claimed structure.

Thus, it is Applicants position that the combination of Taur and Uesugi does not teach or suggest that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate" as defined by independent claim 65. Thus, Applicants respectfully submit that independent claim 65 is patentable over the prior art of record. Further, dependent claim 69 is similarly patentable because of its dependency from patentable independent claim 65 as well as because of the additional features of the invention it defines. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the obviousness rejection based on the combination of Taur and Uesugi.

D. The Rejection Based on Taur in view of Pfiester

As shown above, Taur does not teach or suggest the invention defined by independent claim 65. As shown below, Pfiester similarly does not teach or suggest the invention defined by independent claim 65. Therefore, it is Applicants position that the proposed combination of references does not teach or suggest the invention defined by independent claims 65. Therefore, independent claim 65 (and dependent claim 70) are both patentable over prior art of record.

More specifically, the foregoing arguments regarding the Taur patent are hereby incorporated by reference. With respect to Pfiester, this reference also does not teach or suggest many features defined by independent claim 65 including that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate." Because the invention forms the first gate and the second gate in separate processing steps, the

invention can form a structure that utilizes the same material for the different gates (e.g., polysilicon), yet dopes the first and second gates with different concentrations of impurity to adjust the work function of the device properly.

Pfiester does not disclose such a feature. Instead, Pfiester explains that the upper gate 26 is made of a "physically different material and located in different physical space" than the lower gate (col 5, lines 16-20). More specifically, the lower gate 24 comprises a portion of the substrate that is doped to become a conductor, while the upper gate 26 comprises a deposited metal or polysilicon. Thus, Pfiester teaches that the upper and lower gate must be different materials, which is directly contrary to the claimed invention that utilizes the same material for the upper and lower gate, where this same material has a different doping concentration between the upper and lower gate. Thus, it is Applicants position than Pfiester cannot teach or suggest the invention defined by independent claim 65.

Thus, Applicants submit that the combination of Taur and Pfiester does not teach or suggest that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate" as defined by independent claim 65. Thus, Applicants respectfully submit that independent claim 65 is patentable over the prior art of record. Further, dependent claim 70 is similarly patentable because of its dependency from patentable independent claim 65 as well as because of the additional features of the invention it defines. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the obviousness rejection based on the combination of Taur and Pfiester.

E. The Rejection Based on Taur in view of Yamanaka

As shown above, Taur does not teach or suggest the invention defined by independent claim 65. As shown below, Yamanaka similarly does not teach or suggest the invention defined by independent claim 65. Therefore, it is Applicants position that the proposed combination of references does not teach or suggest the invention defined by independent claims 65. Therefore, independent claim 65 (and dependent claims 73 and 74) are patentable over prior art of record.

More specifically, the foregoing arguments regarding the Taur patent are hereby incorporated by reference. With respect to Yamanaka, this reference also does not teach or suggest many features defined by independent claim 65 including that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate." Because the invention forms the first gate and the second gate in separate processing steps, the invention can form a structure that utilizes the same material for the different gates (e.g., polysilicon), yet dopes the first and second gates with different concentrations of impurity to adjust the work function of the device properly.

Yamanaka does not disclose such a feature. Instead, Yamanaka explains that the upper and lower gate electrodes are formed of the same material. More specifically, in column 11, lines 5-9, Yamanaka explains that both gates are formed of a high content n+ polysilicon film. This indicates that the doping of both gates should be the same which directly teaches away from the claimed invention that utilizes gates having different doping concentrations. Therefore, the invention defined by independent claim 65 is not directly taught by Yamanaka, nor is it obvious in view of the teachings of Yamanaka.

Thus, it is Applicants position that the combination of Taur and Yamanaka does not teach or suggest that the "first gate comprises the same material as said second gate, and has a different doping concentration than said second gate" as defined by independent claim 65. Thus, Applicants respectfully submit that independent claim 65 is patentable over the prior art of record. Further, dependent claims 73 and 74 are similarly patentable because of their dependency from patentable independent claim 65 as well as because of the additional features of the invention they define. In view the foregoing, the Examiner is respectfully requested to reconsider and withdraw the obviousness rejection based on the combination of Taur and Yamanaka.

II. Formal Matters and Conclusion

In view of the foregoing, Applicants submit that claims 1, 3-13, 15-20, 44, 55, 57-65, and 67-74, all the claims presently pending in the application, are patentably distinct from the prior

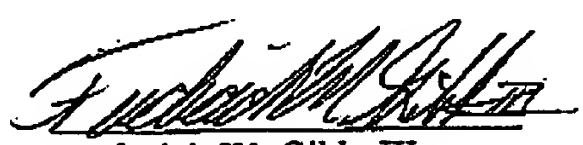
art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 50-0510.

Respectfully submitted,

Dated: 9/28/04



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